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**Filed** : March 30, 2005

### **REMARKS**

Claims 1 and 9 have been amended by incorporating therein the limitations of Claims 2 and 10, respectively. Claims 2 and 10 have been canceled accordingly without prejudice. Claim 6 has been amended to change the dependency from Claim 4 to Claim 3. Claims 17-19 have been added. Support for the new claims can be found on page 6, lines 13-17, for example.

No new matter has been added. Applicant respectfully requests entry of the amendments and reconsideration of the present application in view of the amendments and the following remarks.

#### **Claim rejections under 35 U.S.C. § 103**

Claims 1-16 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Suwa et al.(2003/0165764) in combination with Suwa et al.(20030118930) and Menzel et al.(US5870661). Applicant wishes to note that neither of the Suwa et al. references qualify as prior art to the presently pending application.

The present application is the U. S. national phase of a PCT application filed on September 18, 2003 and claims priority to a Japanese application No.2002-286510 filed on September 30, 2002. Although the applicant cannot currently provide a translation of the priority document, a copy of the priority document in Japanese is attached hereto (see Appendix A). Applicant is currently in a process of preparing an English translation of the priority document and the English translation will be provided in a supplemental amendment shortly. In the meantime, a comparison of this priority document with the publication of the international application reveals that the Japanese characters, drawings and tables in the two applications are substantially overlapping. Thus, it is clear that the present application is entitled to the benefit of the September 30, 2002 Japanese priority date. This date is prior to the U.S. filing dates of either of the two cited Suwa references. Thus, the Suwa references do not qualify as prior art to the present application.

Nevertheless, the presently pending claims are patentable over the references cited by the Examiner in view of the following remarks.

Claim 1 has been amended and now recites:

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1. An electrophotographic toner used for an image forming method that utilizes a heat-pressure type fuser equipped with a fusing member having a surface layer containing polybenzimidazole, said electrophotographic toner comprising at least a cycloolefin copolymer resin as a binder resin, wherein

said cycloolefin copolymer resin comprises a mixture of 0 to 75 percent by weight of a low molecular weight component having a weight-average molecular weight of less than 15,000, 5 to 25 percent by weight of a medium molecular weight component having a weight-average molecular weight of 15,000 to 100,000, and 20 to 95 percent by weight of a high molecular weight component having a weight-average molecular weight of more than 100,000. (Emphasis added)

Claim 1 has been amended to incorporate therein the subject matter of Claim 2. Menzel gives absolutely no indication of a cycloolefin copolymer resin to be contained in an electrophotographic toner. Suwa (764) discloses a cyclic terpene-phenol copolymer which could be regarded as a form of cycloolefins. Suwa (930) also discloses a cycloolefin copolymer resin to be used for a toner as a binder. However, both Suwa (764) and Suwa (930) fail to disclose the specific combination of cycloolefin components of different weight-average molecular weights recited in Claim 1, i.e. (i) 0 to 75 percent by weight of a low molecular weight component having a weight-average molecular weight of less than 15,000, (ii) 5 to 25 percent by weight of a medium molecular weight component having a weight-average molecular weight of 15,000 to 100,000, and (iii) 20 to 95 percent by weight of a high molecular weight component having a weight-average molecular weight of more than 100,000.

Suwa (764) does not teach or suggest the above limitations. Further, Suwa (764) does not recognize important function and effects of the molecular weights of the cycloolefin components which is evidenced in its disclosure. In Example 1 of Suwa (764), a cyclic terpene-phenol copolymer having only a weight average molecular weight of 600 is used. (page 7, paragraph 0104)

With regard to Suwa (930), Suwa (930) states that "it is preferable for the cycloolefin copolymer as a binder resin in the toner to have ...a weight average molecular weight (Mw) of 9,000-60,000" (page 2, paragraph 0016). Suwa (930) gives no indication of the high molecular weight component of the cycloolefin copolymer (Mw of more than 100,000) recited in Claim 1. Suwa (930) does not recognize important function of the high molecular weight of cycloolefin copolymer, which is described in the instant specification as follows.

If the aforementioned high molecular weight component is less than 20 percent by weight, wrapping around the fusing member will occur and the non-offset temperature at high-temperature region will drop. If the high molecular weight component exceeds 95 percent by weight, uniform kneading property will drop and toner performance will be affected, and fusing property at low temperature will also drop. (*Specification*, page 8, lines 5-9)

Suwa (930) further shows the evidence that importance of the high molecular weight component of the cycloolefin is not recognized. For example, in the Examples and Comparative Examples of Suwa (930), weight-average molecular weights (Mw) of the cycloolefin copolymers are in a range of only 9,800 to 70,000 (page 7, Table.1). In Suwa (930), the above effects due to the specific composition recited in Claim 1 cannot be expected. A person skilled in the art would not be able to realize the specific composition and its effects in view of the references.

With regard to “polybenzimidazole” recited in Claim 1, the Office Action states:

Both Suwa et al teach the binder resin and the use of a fixing roller in the image forming method. The fixing roller is not teaching the use of a polybenzimidazole as a coating of a surface in the heat fixing of an image. Menzel et al teaches the heat fixing in an electrostatic image forming process. Any suitable thermally-stable material having a low thermal conductivity such as polybenzimidazole (PBI) can be used as a surface coating note Col.5 and Col.6. It would be obvious to one of ordinary skill in the art at the time of applicants’ invention with a reasonable expectation of success to use the thermal stability of the (PBI) as the surface coating of the fixing rollers in the thermal fixing of the image produced by toners of Suwa et al to prevent offset and degloss in the formed image.

However, Menzel teaches that the polybenzimidazole (PBI) is used to form the media support (40) for **its low thermal conductivity** in order to minimize heat transfer to the media (18). In contrast, the claimed invention uses polybenzimidazole for the surface layer of a fusing member of a heat-pressure type fuser. Since the fusing member transfers heat from the heat source (4) to its fusing surface, a person in the art would avoid using polybenzimidazole for the surface layer of a fusing member in view of Menzel. Menzel gives absolutely no reason to use polybenzimidazole for the surface layer of the fusing member. Furthermore, polybenzimidazole is particularly useful when the specific toner recited in Claim 1 is used, which is demonstrated in Examples 4-7 and Comparative Examples 1-4 in Table.1 of the instant specification. The instant specification further describes unexpected effects due to the polybenzimidazole as follows.

Use of the electrophotographic toner proposed by the present invention using cycloolefin copolymer resins as binder resins will **prevent offset or wrapping** during the fusing process, even when many sheets are printed continuously, and **maintain sufficient image density and other desired characteristics for a long period**, provided that an image forming method is used that utilizes a heat-pressure type fuser equipped with a fusing member having a PBI-containing surface layer. In addition, this toner provides other benefits such as **excellent transfer efficiency and durability, reduced carrier contamination, reduced toner consumption, and no degradation of the fusing member.** (*Specification*, page 5, lines 20-27)

There is no way that a person skilled in the art would realize the above described effects due to the polybenzimidazole in view of Menzel. Furthermore, since none of the references teaches or suggests the specific composition of the cycloolefin, the suggested modification of combining the references would not lead to the claimed invention. At least for these reasons, Claim 1 cannot be obvious over Suwa (764), Suwa (930) and Menzel.

With regard to Claim 4, Claim 4 recites:

4. An electrophotographic toner containing a cycloolefin copolymer resin as a binder resin, wherein said cycloolefin copolymer resin comprises a mixture of 0 to 75 percent by weight of a low molecular weight component having a weight-average molecular weight of less than 15000, 5 to 25 percent by weight of a medium molecular weight component having a weight-average molecular weight of 15000 to 100000, and 20 to 95 percent by weight of a high molecular weight component having a weight-average molecular weight of more than 100000. (*Emphasis added*)

Since Claim 4 recites the limitation similar to Claim 1 with regard to the specific composition of the cycloolefin copolymer resin, the above same arguments for Claim 1 apply here, in which Menzel gives absolutely no indication of a cycloolefin copolymer resin to be contained in an electrophotographic toner and both Suwa (764) and Suwa (930) give no indication of the specific composition of the cycloolefin components recited in Claim 4. Particularly, the high molecular weight component of the cycloolefin copolymer (Mw of more than 100,000) recited in Claim 4 is not disclosed in any of the references. Since none of the references teaches or suggests the specific composition of the cycloolefin, the suggested modification of combining the references would not lead to the claimed invention. At least for this reason, Claim 4 cannot be obvious over the references.

With regard to Claim 9, Claim 9 has been amended and now recites:

9. An image forming method which comprises supplying a transfer paper with a toner image formed by an electrophotographic toner that comprises a cycloolefin copolymer resin as a binder resin, to a heat-pressure type fuser equipped with a fusing member having a polybenzimidazole-containing surface layer, thereby fusing said toner image,

wherein said cycloolefin copolymer resin comprises a mixture of 0 to 75 percent by weight of a low molecular weight component having a weight-average molecular weight of less than 15,000, 5 to 25 percent by weight of a medium molecular weight component having a weight-average molecular weight of 15,000 to 100,000, and 20 to 95 percent by weight of a high molecular weight component having a weight-average molecular weight of more than 100,000, and wherein the content of cycloolefin copolymer resin in the binder ranges from 50 percent by weight to 100 percent by weight. (Emphasis added)

Claim 9 is a method claim which recites the limitation similar to Claim 1 with regard to the polybenzimidazole-containing surface layer and the specific composition of the cycloolefin copolymer resin. The above same arguments for Claim 1 apply here. Menzel gives absolutely no indication of a cycloolefin copolymer resin to be contained in an electrophotographic toner. Suwa (764) and Suwa (930) give no indication of the specific composition of the cycloolefin components recited in Claim 9. Particularly, the high molecular weight component of the cycloolefin copolymer (Mw of more than 100,000) recited in Claim 9 is not disclosed in any of the references. Menzel gives absolutely no reason to use polybenzimidazole for the surface layer of the fusing member and the significant effects of (i) preventing offset or wrapping during the fusing process, (ii) maintaining sufficient image density and other desired characteristics for a long period, (iii) excellent transfer efficiency and durability, (iv) reduced carrier contamination, (v) reduced toner consumption, and (vi) no degradation of the fusing member, cannot be expected in view of Menzel.

In view of the foregoing, the suggested modification of combining the references would not lead to the claimed invention. At least for this reason, Claim 9 cannot be obvious over Suwa (764), Suwa (930) and Menzel.

With regard to Claim 12, Claim 12 recites:

12. An image forming method which comprises supplying a transfer paper with a toner image formed by an electrophotographic toner that comprises, as a binder resin, a cycloolefin copolymer resin comprising a mixture of 0 to 75 percent by weight of a low molecular weight component having a weight-average molecular weight of less than 15000, 5 to 25 percent by weight of a medium

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molecular weight component having a weight-average molecular weight of 15000 to 100000, and 20 to 95 percent by weight of a high molecular weight component having a weight-average molecular weight of more than 100000, to a heat-pressure type fuser, thereby fusing said toner image. (Emphasis added)

Since Claim 12 recites the limitation similar to Claim 1 with regard to the specific composition of the cycloolefin copolymer resin, the above same arguments for Claim 1 apply, in which Menzel gives absolutely no indication of a cycloolefin copolymer resin to be contained in an electrophotographic toner and both Suwa (764) and Suwa (930) give no indication of the specific composition of the cycloolefin components recited in Claim 12. Since none of the references teaches or suggests the specific composition of the cycloolefin, the suggested modification of combining the references would not lead to the claimed invention. At least for this reason, Claim 12 cannot be obvious over Suwa (764), Suwa (930) and Menzel.

Claims 3, 5-8, 11 and 13-16 are dependent claims, which ultimately depend from one of Claims 1, 4, 9 and 12, and thus cannot be obvious over the references.

Applicant respectfully requests withdrawal of the rejections.

#### New Claims

New Claims 17-19 have been added. Claims 17-19 are dependent ultimately from Claim 1 or 4, and thus patentable in view of the foregoing.

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**CONCLUSION**

In light of the Applicant's amendments to the claims and the foregoing Remarks, it is respectfully submitted that the present application is in condition for allowance. Should the Examiner have any remaining concerns which might prevent the prompt allowance of the application, the Examiner is respectfully invited to contact the undersigned at the telephone number appearing below.


Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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Dated: November 16, 2007

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